Analyzing ebike commuters motives, travel behaviour and experiences using GPS-tracking and interviews

Plazier, Paul

“Cycling was never so easy!”

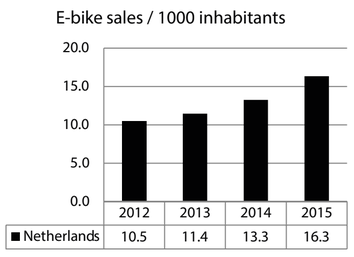
Analyzing e-bike commuters motives, travel behaviour and experiences using GPS-tracking and interviews

university of groningen
faculty of spatial sciences

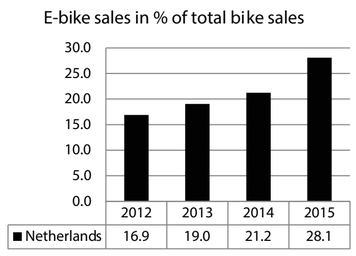
Paul A. Plazier, Gerd Weitkamp, Agnes E. van den Berg
Faculty of Spatial Sciences, University of Groningen, NL

Background: e-bike use, growth and diversification

- Almost 1 in 3 bikes sold in The Netherlands today has some form of electrical assistance.



	2012	2013	2014	2015
Netherlands	10.5	11.4	13.3	16.3



	2012	2013	2014	2015
Netherlands	16.9	19.0	21.2	28.1

Data: EUROSTAT, 2016
CONEBI, 2016

- E-bikes permit covering longer distances at higher average speeds against reduced physical effort (Fishman & Cherry 2015)
- Despite high use among older people and for recreational purposes, they are increasingly used by younger retirees, working adults and younger people for commuting, shopping and going to school (Peine et al, 2016; KIM, 2016; Plazier et al, 2017)
- E-bikes’ contribution to more sustainable transport behavior to date seems limited, but potential is high
- To what extent can e-bikes substitute motorized commuting?

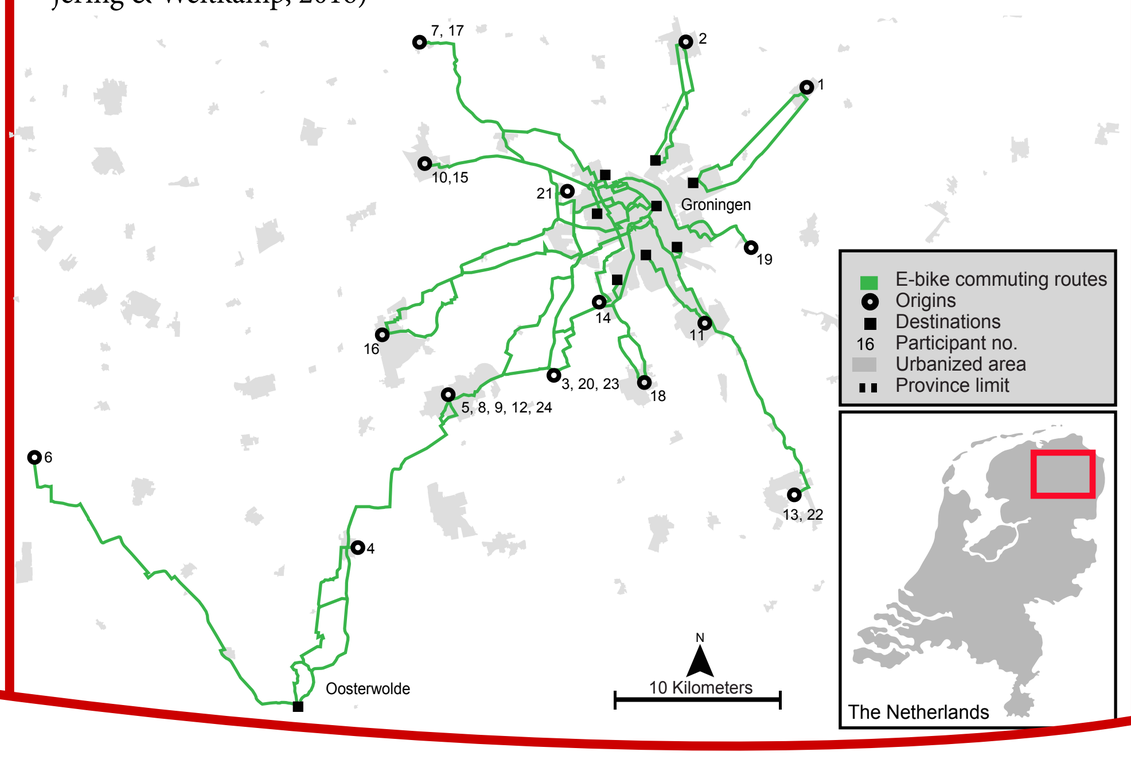
Objectives and research questions

- Provide further insight in the potential of e-bikes to subtitute motorized commuting

1. What were motives for purchasing and starting to use an e-bike?
2. Under what conditions can e-bikes substitute motorized commuting?
3. What role do travel experiences play in the daily commute by e-bike?

Data and methods

- *N* = 24 e-bike commuters (M= 45, SD = 9,3)
- Participants formerly commuted by car or public transport, and had recently adopted an e-bike. They still used e-bike, car and public transport interchangeably
- Phase 1: 14-day GPS tracking of all outdoor movements. Phase 2: follow-up in-depth interviews
- GPS-data formed the input for follow-up in-depth interviews, transcripts were used to complement and validate GPS-data
- Complementing and contrasting results permits a “multi-layered understanding” (Meijering & Weitkamp, 2016)

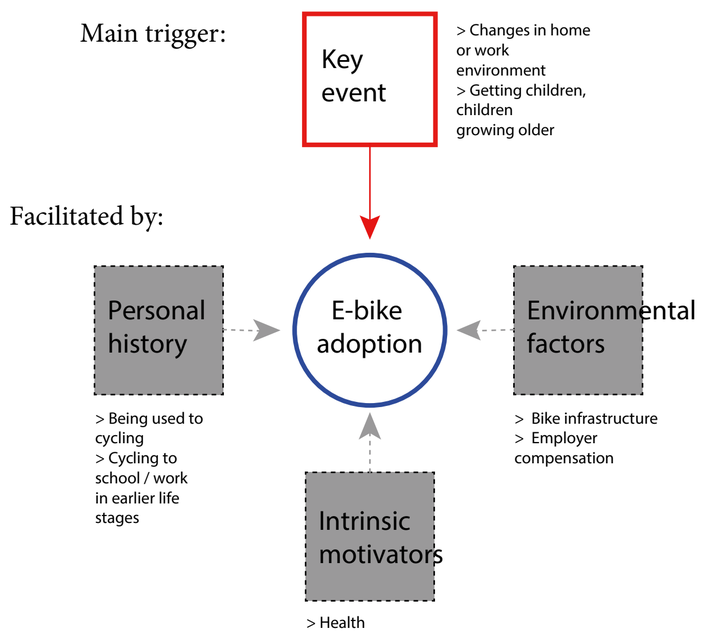


Main findings

E-bike adoption mostly followed a key event

- The majority of participants adopted an e-bike following changes in the home or work environment. These changes prompted participants to reconsider prevailing commuting habits.

“Both my children started high school this year, and they go there by bike. Well, I want to bike too! But I don’t want to arrive at work all warm and sweaty. So that’s when it came to me” (participant 4, 40 years old, 10 km commute)



Model after Clark et al, 2014

E-biking to work took longer than taking car or public transport

Commuting trips characteristics (N=305)			
Mode	N (%)	Km (SD)	Min (SD)
Car	86 (28.2%)	24.0 (30.1)	29.7 (19.0)
E-bike	193 (63.3%)	14.1 (5.5)	46 (13.5)
Bus	19(6.2%)	20.5 (3.5)	46.6 (8.6)
Train	5 (1.6%)	197.4 (12.3)	148.2 (13.0)

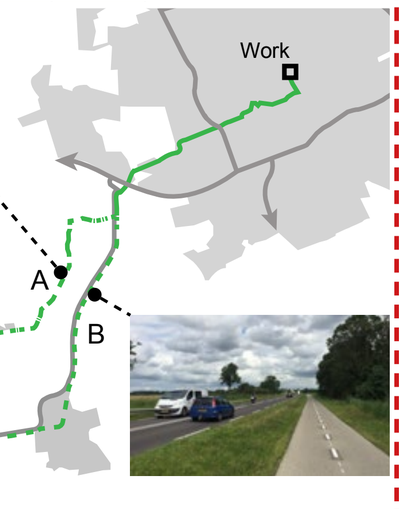
- The majority of the commutes were done by e-bike
- E-bike commutes were shorter in distance, but took longer than commutes by car and bus. This suggests that equal or longer travel times did not deter participants from using an e-bike instead of car or bus.
- E-bike use was lower when more activities were combined and in non-work-related journeys, in which car use, conventional cycling and walking were more common.

Commuting by e-bike balanced the pro’s and cons of regular cycling

- Participants stated that commuting by e-bike gave them benefits of conventional cycling compared to motorized transport (enjoyment of outdoor, physical activity; independency) while mitigating its relative disadvantages (longer travel time; increased effort).
- Daily schedules and weather conditions were possible impediments, although electric assistance negated wind influence.

Electric assistance provided flexibility in route choice

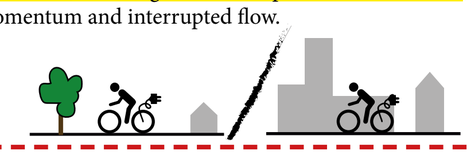
- Participants generally preferred enjoyable and quiet routes over faster and more direct ones.
- Traveling by e-bike had intrinsic utility for the participants (e.g. exposure to environment, breathing fresh air) and utility for activities conducted while riding (mentally preparing for the day ahead, or clearing the mind), resulting in longer commuting durations than strictly necessary (Mokhtarian et al, 2001)



	Route A	Route B
Length	15.5 km	15.3 km
Duration	50 mn	45 mn
Average speed	18.6 km/h	20.4 km/h

Cycling was experienced differently in and outside the city

- Participants mentioned the difference between assisted cycling in and outside the city was a major influence on cycling experience.
- Overall, they felt they got less advantage of the e-bike in the city due to the increase in traffic, traffic lights and complex traffic situations, which led to loss of momentum and interrupted flow.



“My speed is a constant 26 [km/h] (..) but that changes the moment I arrive in the city. There are schools, a shopping mall, I need to take into account other traffic (..) children crossing, crosswalks..” (participant 20, aged 51, 13 km commute)

“Route A is a fantastic route, I take it practically every day. It is way more fun, straight through nature, no other roads, no traffic (..) It would be shorter going through route B. But I prefer to take the scenic route (..) It is more inviting, it incentivizes to take the e-bike” (participant 8, aged 44, 15 km commute).

Conclusions

- E-biking manifest itself as an appealing alternative to motorized commuting for those for which conventional cycling is not a realistic option.
- Direct competition with car use means that efforts to increase e-bike use should be directed at car commuters
- E-bike commuting might not always be the faster option, but enabling an appealing e-bike ride to work can mitigate the role of increased travel time in commuting.
- The findings suggests that health and enjoyment can make a significant contribution to realizing sustainable travel behaviour. Promoting health and enjoyment of e-biking can support the development of sustainable transport systems that support active and healthy lifestyles.

Past, current and future research

- The authors of this poster previously studied e-bike use among the younger population, see Plazier et al, 2017, “E-bike use among the younger population, a study among Dutch students” *Travel Behaviour and Society 8*
- The project presented here is under review with an international academic journal
- Current and future research explores the contribution of e-bikes to mobility in daily life of rural residents. This study is conducted with Provincie Groningen and Gemeente Eemsmond.
- For more, visit www.researchgate.net/profile/Paul_Plazier

Clark, B. et al., 2014. Examining the relationship between life transitions and travel be- haviour change: New insights from the UK household longitudinal study. In 46th Universities’ Transport Studies Group Conference, Newcastle University, 6-8 January 2014. pp. 6–8. Fishman, E. & Cherry, C., 2015. E-bikes in the Mainstream: Reviewing a Decade of Research. Transport Reviews, (July 2015), pp.1–20. ; KiM, 2016. Mobiliteitsbeeld 2016 Kennisinstituut voor het Mobiliteitsbeleid, ed., Den Haag: Kennisinstituut voor het Mobiliteitsbeleid. Meijering, L. & Weitkamp, G., 2016. Numbers and narratives: Developing a mixed-methods approach to understand mobility in later life. Social Science & Medicine. Mokhtarian, P.L., Salomon, I. & Lothlorien, R.S., 2001. Understanding the Demand for Travel : It’s Not Purely “ Derived .” Innovation, the European Journal of Social Science Research, 14(4). Peine, A., van Cooten, V. & Neven, L., 2016. Rejuvenating Design: Bikes, Batteries, and Older Adopters in the Diffusion of E-bikes. Science, Technology & Human Values, pp.1–31. Plazier, P.A., Weitkamp, G. & Van den Berg, A.E., 2017. The potential for e-biking among the younger population: a study of Dutch students. Travel Behaviour and Society, 8, pp.37–45